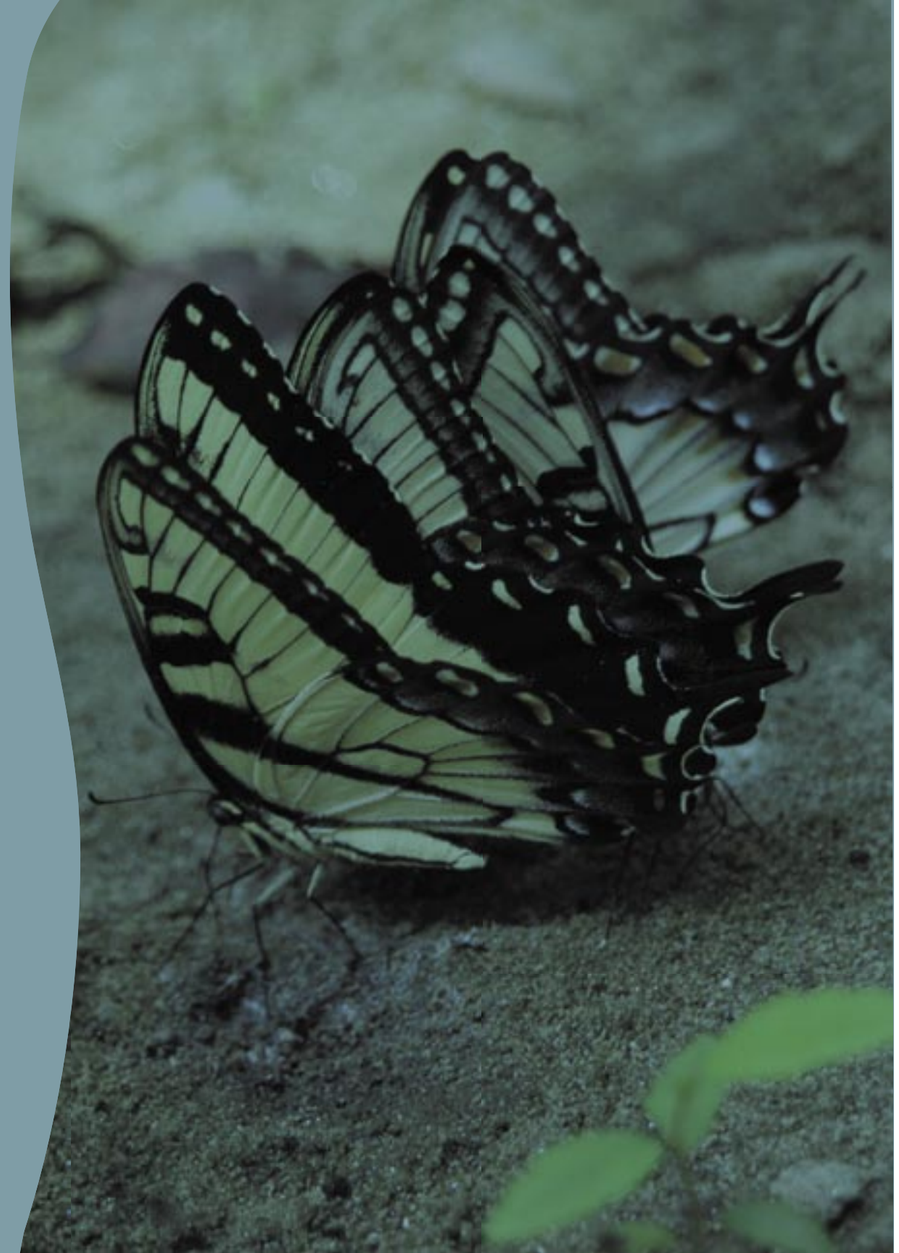
VALUES AND CHALLENGES

IN URBAN ECOLOGY



National Capital Region, Center for Urban Ecology

Natural Resources and Science Program

An archipelago of parks, woodlands, and other green spaces occurs throughout the mid-Atlantic. Vestiges of greater natural landscapes are steadily being reduced through human development. These remnant green spaces occur in varying shapes, sizes, and extent of connectivity. The status of their protection is as diverse as their intended purpose and ownership. The National Park Service's National Capital Region oversees nationally significant areas, including historic sites, battlefields, and parkways. These green islands protect significant natural resources amid metropolitan Washington, D.C.

The Region's Center for Urban Ecology in cooperation with park resource managers and its academic and other partners is striving to learn more about the natural resources within these remnant parks and how threats can be better understood and mitigated. The articles within this booklet provide a sample of some of these endeavors. While the focus is on the National Parks of the National Capital Region, the resources and threats extend throughout the mid-Atlantic area.

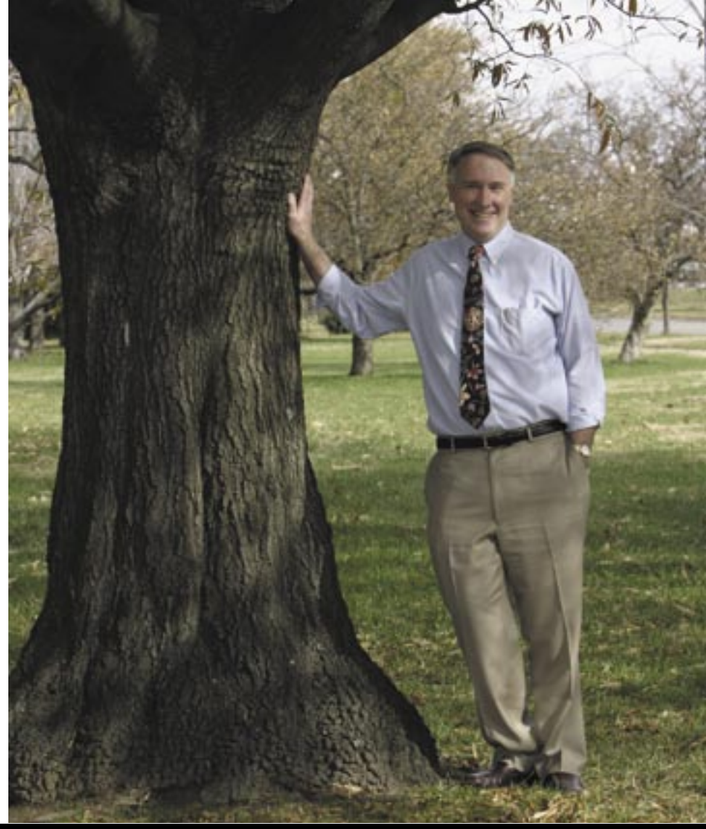
While much is already known about the natural resources of the parks, unique species and habitats are still being discovered and described. The Region's small, urban parks hold and protect biological richness in the form of a surprising number of species and communities. Recently, scientists working in the Region have found species new to science in groups as diverse as dragonflies and amphipods (subterranean, shrimp-like animals); these stories are included in this booklet.

Continued research in urban parks develops an integrated understanding of how to protect damaged or stressed systems. For instance, protecting federally listed species, such as a small wild carrot, harperella (*Ptilimnium nodosum*), means determining biological requirements in the face of changing riparian habitats along the Potomac River. Some native species, such as white-tailed deer (*Odocoileus virginianus*) and Canada geese (*Branta canadensis*), become overabundant in urbanizing landscapes and damage the park ecosystems, which no longer support natural predators of these larger species. Scientific studies offer insights into restoring population dynamics and minimizing threats to natural resources.

Extensive and expansive urban growth poses monumental challenges to practical resource management. As development intensifies, it is increasingly difficult for many native species and natural communities to survive. Many parks are surrounded by intensive development right up to their borders. Accompanying this urbanization is an expanding and interconnected array of resource threats, including air and water pollution and the increasing diversity and magnitude of invasive non-native species. Impervious surfaces, like parking lots and roads, are major urban challenges, creating hydrological havoc by increasing the amount of water channeled through fragmented, natural habitats.

The National Parks offer valuable ecosystem services. Air flowing through stream beds, urban forests, and meadows create reservoirs of fresher air and microhabitats for beleaguered species. Precipitation and water moving through the parks are filtered through the vegetation and soil, removing some pollutants and providing habitats for subterranean animals. Such ecosystem services are illustrated within this booklet; one article describes scientists and the parks sampling the urban forest and measuring its contributions to the health and well-being of the urban-suburban environment and its citizens.

Protecting natural resources sustains the natural processes that provide these ecological services. We hope that encouraging and conducting studies in urban National Parks will create greater awareness about the resource values of these and other viable remnants of natural landscapes. Sharing information gained from collaborative and integrated scientific studies provides the land managers with more options and allows them to collectively protect and restore these valuable resources.



Dr. Jim Sherald, Chief of Natural Resources and Science, National Capital Region

CENTER FOR URBAN ECOLOGY

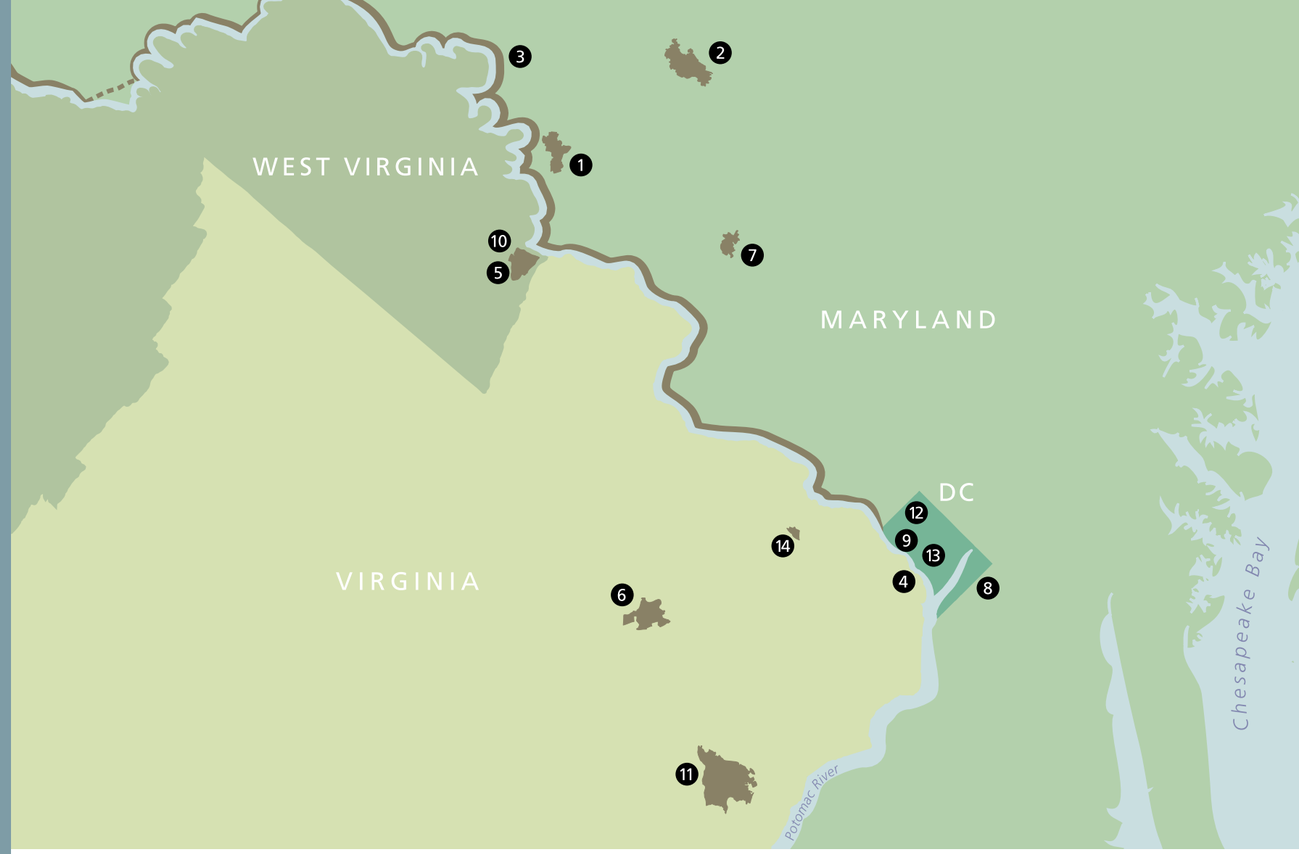
Natural Resource Challenge Congress is interested in the management of the National Parks. Interested enough to take an unprecedented step in 1998 and give a legal mandate for research within the National Park System to support management decisions, as well as broader scientific values. The National Parks Omnibus Management Act (Public Law 105-391) directs the National Park Service to encourage others to conduct research in the parks for the benefit of park management. Further, Title II of the act requires superintendents and other park officials to base decisions upon sound, research-based information. This ensures the full use of the results of science studies.

To put the mandate into action, Congress passed the Natural Resource Challenge: The National Park Service's Action Plan for Preserving Natural Resources in 2000, beginning a five-year, funded initiative to address the general lack of knowledge about natural resources and to enhance their management. In the National Capital Region, the Natural Resource Challenge provides funding for scientific professionals who support park managers. The Challenge funds an Air Resource Specialist, an Aquatic Ecologist, the National Capital Region Network (an Inventory and Monitoring network), the Exotic Plant Management Team, Chesapeake Watershed Cooperative Ecosystem Studies Unit, and the Urban Ecology Research Learning Alliance (a Research Learning Center). All of these entities work to increase the role of science in the management of park resources.

NATIONAL PARK SERVICE · NATIONAL CAPITAL REGION

CENTER FOR URBAN ECOLOGY

The Center for Urban Ecology is an interdisciplinary team that provides scientific guidance, technical assistance and education for the preservation, conservation and enhancement of park resources within urbanizing landscapes.



The Center for Urban Ecology serves 14 parks in the National Capital Region

1 Antietam National Battlefield
2 Catoctin Mountain Park
3 Chesapeake & Ohio Canal National Historical Park
4 George Washington Memorial Parkway
5 Harpers Ferry National Historical Park
6 Manassas National Battlefield Park
7 Monocacy National Battlefield
8 National Capital Parks - East
9 National Mall & Memorial Parks
10 Potomac Heritage National Scenic Trail (Headquarters)
11 Prince William Forest Park
12 Rock Creek Park
13 President's Park
14 Wolf Trap National Park for the Performing Arts